2017 OREGON RESIDENTIAL SPECIALTY CODE
ENERGY EFFICIENCY - PRESCRIPTIVE ENVELOPE REQUIREMENTS

*All conditioned spaces within residential buildings shall comply with Table N1101.1 (1) and two additional measures from Table N1101.1(2)
*Alterations and repairs, historical buildings and change of use or occupancy to buildings, structures or portions thereof shall comply with Table N1101.2 to the greatest extent practical.
*Alteration or repair of conditional nonresidential buildings that are changing to residential shall use Table N1101.2 to the greatest extent practical and select one measure from Table N1101.3
*Additions to existing buildings/structures may be made without making the entire building/structure comply if the new additions comply with the requirements of this chapter.
*Large additions: Additions equal to or more than 40% of existing building heated floor area or 600sf, whichever is less, shall comply with Table N1101.1(2)
*Small Additions: Additions that are less than 40% of the existing building heated floor area or less than 600sf in area, whichever is less, shall be required to select one measure from Table N1101(2) or comply with Table 1101.3

TABLE N1101.1 (1) PRESCRIPTIVE ENVELOPE REQUIREMENTS (a)

BUILDING COMPONENT	STANDARD BASE CASE		LOG HOMES ONLY	
	Required Performance	Equiv. Value(b)	Required Performance	Equiv. Value(b)
Wall insulation-above grade	U-0.059(c)	R-21 Intermediate (c)	Note d	Note d
Wall insulation-above grade (e)	C-0.063	R-15/R-21	C-0.063	R-15/R-21
Flat ceilings (f)	U-0.021	R-49	U-0.020	R-49 A (h)
Vaulted ceilings (g)	U-0.033	R-30 Rafter of R-30 A (g,h) Scissor Truss	U-0.027	R-38A(h)
Underfloors	U-0.033	R-30	U-0.033	R-30
Slab edge perimeter	F-0.520	R-15	F-0.520	R-15
Heated slab interior (i)	n/a	R-10	n/a	R-10
Windows (j)	U-0.30	U-0.30	U-0.30	U-0.30
Window area limitation (j,k,)	n/a	n/a	n/a	n/a
Skylights (l)	U-0.50	U-0.50	U-0.50	U.0.50
Exterior doors (m)	U-0.20	U-0.20	U-0.54	U-0.54
Exterior doors w/ > 2.5 ft ² glazing (n)	U-0.40	U-0.40	U-0.40	U-0.40
Forced air duct insulation	n/a	R-8	n/a	R-8

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m², 1 degree = 0.0175 rad.

a. As allowed in Section N1104.1, thermal performance of a component may be adjusted provided that overall heat loss does not exceed the total resulting from conformance to the required U-value standards. Calculations to document equivalent heat loss shall be performed using the procedure and approved U-values contained in Table N1104.1 (1).

a. R-values used in this table are nominal for the insulation only in standard wood framed construction and not for the entire assembly.
b. Wall insulation requirements apply to all exterior wood framed, concrete or masonry walls that are above grade. This includes cripple walls and rim joist areas. Nominal compliance with R-21 insulation and Intermediate Framing (N1104.5.2) with insulated headers.
c. The wall component shall be a minimum solid log or timber wall thickness of 3.5 inches (90 mm).
d. Below-grade wood, concrete or masonry walls include all walls that are below grade and do not include those portions of such wall that extend more than 24 inches (609.6 mm) above grade.
e. Insulation levels for ceilings that have limited attic/rafter depth such as dormers, bay windows or similar architectural features totaling not more than 150 square feet (13.9 m²) in area may be reduced to not less than R-21. When reduced, the cavity shall be filled (except for required ventilation spaces). R-49 insulation installed to minimum 6-inches depth at the top plate at exterior of structure to achieve U-factor.
f. Vaulted ceiling surface area exceeding 50 percent of the total heated space floor area shall have a U-factor no greater than U-0.026 (equivalent to R-38 rafter or scissor truss with R-38 advanced framing).
g. A= Advanced frame construction. See Section N1104.6
h. Heated slab interior applies to concrete slab floors (both on and below grade) that incorporate a radiant heating system within the slab. Insulation shall be installed underneath the entire slab.
i. Sliding glass doors shall comply with window performance requirements. Windows exempt from testing in accordance with Section NF1111.2, Item 3 shall comply with window performance requirements if constructed with thermal break aluminum or wood, or vinyl, or fiberglass frames and double-pane glazing with low-emissivity coatings of 0.10 or less. Buildings designed to incorporate passive solar elements may include glazing with a U-factor greater than 0.35 by using Table N1104.1 (1) to demonstrate equivalence to building envelope requirements.
j. Reduced window area may not be used as a trade-off criterion for thermal performance of any component.
k. **Exception:** Table N1101.1 (2), Envelope Measure 6: calculation allows baseline case 15 percent of total wall area as window when design case utilizes window area of less than 15 percent.
l. Skylight area installed at 2 percent or less of total heated space floor area shall be deemed to satisfy this requirement with vinyl, wood or thermally broken aluminum frames and double-pane glazing with low-emissivity coatings. Skylight U-factor is tested in the 20 degree (0.35 rad) overhead plane in accordance with NFRC standards.
m. A maximum of 28 square feet (2.6 m²) of exterior door area per dwelling unit can have a U-factor of 0.54 or less.
n. Glazing that is either double pane with low-e coating on one surface, or triple pain shall be deemed to comply with this U-0.40 requirement.

TABLE N1101.1 (2) ADDITIONAL MEASURES

ENVELOPE ENHANCEMENT MEASURES (SELECT ONE)
1. High efficiency walls
Exterior walls - U-0.045/R-21 cavity insulation + R-5 continuous
2. Upgraded features:
Exterior walls - U-0.057/R-23 Intermediate or R-21 advanced,
Framed floors - U-0.026/R-38
Windows - U-0.28 (average UA)
3. Upgraded features:
Exterior walls - U-0.055/R-23 Intermediate or R-21 advanced,
Flat ceilings (e) - U-0.017/R-60, and
Framed Floors – U-0.026/R-38
4. Super Insulated Windows and Attic OR Framed Floors
Windows – U-0.22 (Triple Pane Low-e), and Flat ceiling (e) - U- 0.017/R-60 or Framed floors – U-0.026/R-38
5. Air sealing home and ducts
Mandatory air sealing of all wall coverings at top plate and air sealing checklist (f), and Mechanical whole-building ventilation system with rates meeting M1503 or ASHRAE 62.2, and All ducts and air handlers contained within building envelope (d) or All ducts sealed with mastic (b)
6. **High efficiency thermal envelope UA (g)**
Proposed UA is 8% lower than the code UA
CONSERVATION MEASURE (SELECT ONE)
A. High efficiency HVAC System (a)
Gas - fired furnace or boiler with minimum AFUE 94%, or Air-source heat pump with minimum HSPF 9.5/15.0 SEER cooling, or Ground source heat pump COP 3.5 or Energy Star rated
B. Ducted HVAC systems within conditioned space
All ducts and air handlers contained within building envelope (d) *Cannot be combined with Measure 5*
C. Ductless Heat Pump
Ductless heat pump HSPF 10.0 in primary zone of dwelling
D. High efficiency water heater (c)
Natural gas/propane water heater with UEF 0.85 OR Electric heat pump water heater Tier 1 Northern Climate Specification Product

For SI: 1 square foot = 0.093 m², 1 watt per square foot = 10.8 W/m²

a. Appliances located within the building envelope shall have sealed combustion air installed. Combustion air shall be ducted directly from the outdoors.
b. All duct joints and seams sealed with the listed mastic; tape is only allowed at appliance or equipment connections (for service and replacement). Meet sealing criteria of Performance Tested Comfort Systems program administered by the Bonneville Power Administration (BPA).
c. Residential water heaters less than 55 gallon storage volume.
d. A total of 5 % of an HVAC system's ductwork shall e permitted to be located outside of the conditioned space. Ducts located outside the conditioned space shall have insulation installed as required in this code.
e. The maximum vaulted ceiling surface area shall not be greater than 50 percent of the total heated space floor area unless vaulted area has a U-factor no greater than U-0.026.
f. Continuous air barrier. Additional requirement for sealing of all interior vertical walls covering to top plate framing. Sealing with foam gasket, caulk or other approved sealant listed for sealing wall covering material to structural material (example: gypsum board to wood stud framing)
g. Table N1104.1(1) Standard base case design, Code UA shall be at least 8% less than the Proposed UA. Buildings with fenestration less than 15% of the total vertical wall area may adjust the Code UA to have 15% of the wall area as fenestration.

TABLE N1101.2 EXISTING BUILDING COMPONENT REQUIREMENTS

BUILDING COMPONENTS	REQUIRED PERFORMANCE	EQUIVALENT VALUE
Wall insulation	U-0.083	R-15
Flat ceiling	U-0.025	R-49
Vaulted Ceiling >10 inches Nominal rafter depth	U-0.040	R-25
Vaulted ceiling >8 inches Nominal rafter depth	U-0.047	R-21
Underfloor >10 inches nominal joist depth	U-0.028	R-30
Underfloor >8 inches nominal joist depth	U-0.039	R-25
Slab edge perimeter	F-0.52	R-15
Windows	U-0.30	U-0.30
Skylights	U-0.60	U-0.60
Exterior doors	U-0.20	R-5
Exterior doors with >2.5 sqft	U-0.40	R-2.5
Forced air ducts	n/a	R-8

TABLE N1103 SMALL ADDITION ADDITIONAL MEASURES (Select one)

1	Increase the ceiling insulation of existing portion of the home as specified in Table N1101.2
2	Replace all existing single-pane wood or aluminum windows to the U-factor as specified in Table N1101.2
3	Insulate the floor system as specified in Table N1101.2 and install 100% of permanently installed lighting fixtures as CFL, LED, or linear fluorescent or a min. efficacy of 40 lumens per watt as specified in Section N1107.2
4	Test the entire dwelling with a blower door and exhibit no more than 6.0 air changes per hour @ 50 Pascals.
5	Seal and performance test the duct system.
6	Replace existing 78% AFUE or less gas furnace with a 92 % AFUE or greater system.
7	Replace existing electric radiant space heaters with a ductless mini split system with a minimum HSPF of 10.0
8	Replace existing electric forced air furnace with an air source heat pump with a minimum HSPF of 9.5
9	Replace existing water heater with a water heater meeting Conservation Measure D (Table N1101.1(2))